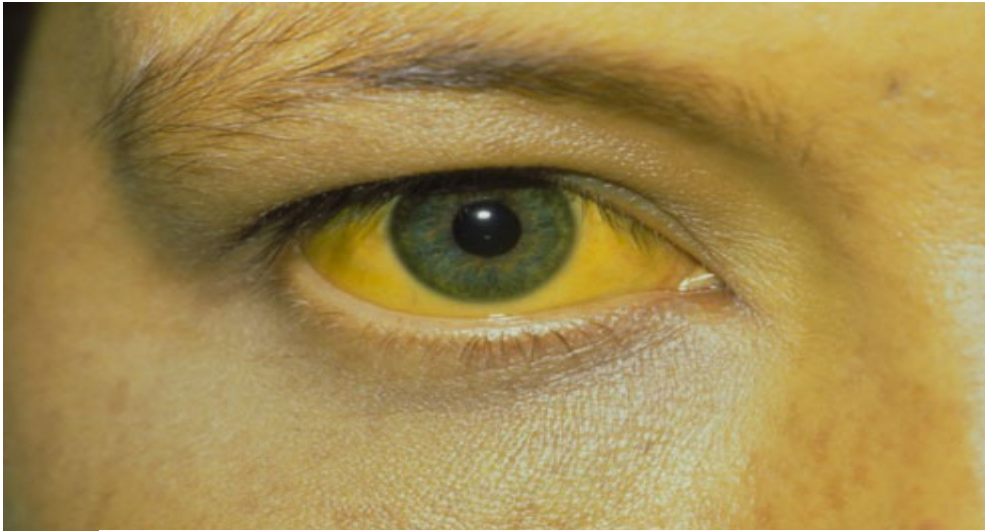


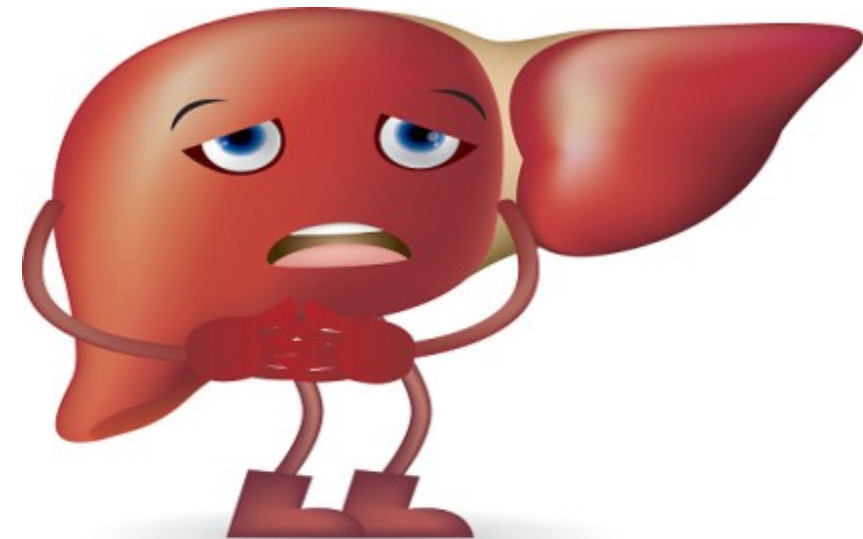


Armed Forces College of Medicine AFCM

Liver diseases



One of your DD should include ??





Hepatic Injury & Acute Hepatitis



Dr. Riham Abu-Zeid
Prof. of Pathology



By the end of this lecture you will

- Identify different types of liver cell necrosis
- Enumerate causes of hepatitis
- Describe clinical & pathologic features of acute viral hepatitis
- Explain the fate of acute viral hepatitis
- Correlate pathologic features of acute hepatitis with its clinical picture ,fate and complications

Lecture Plan

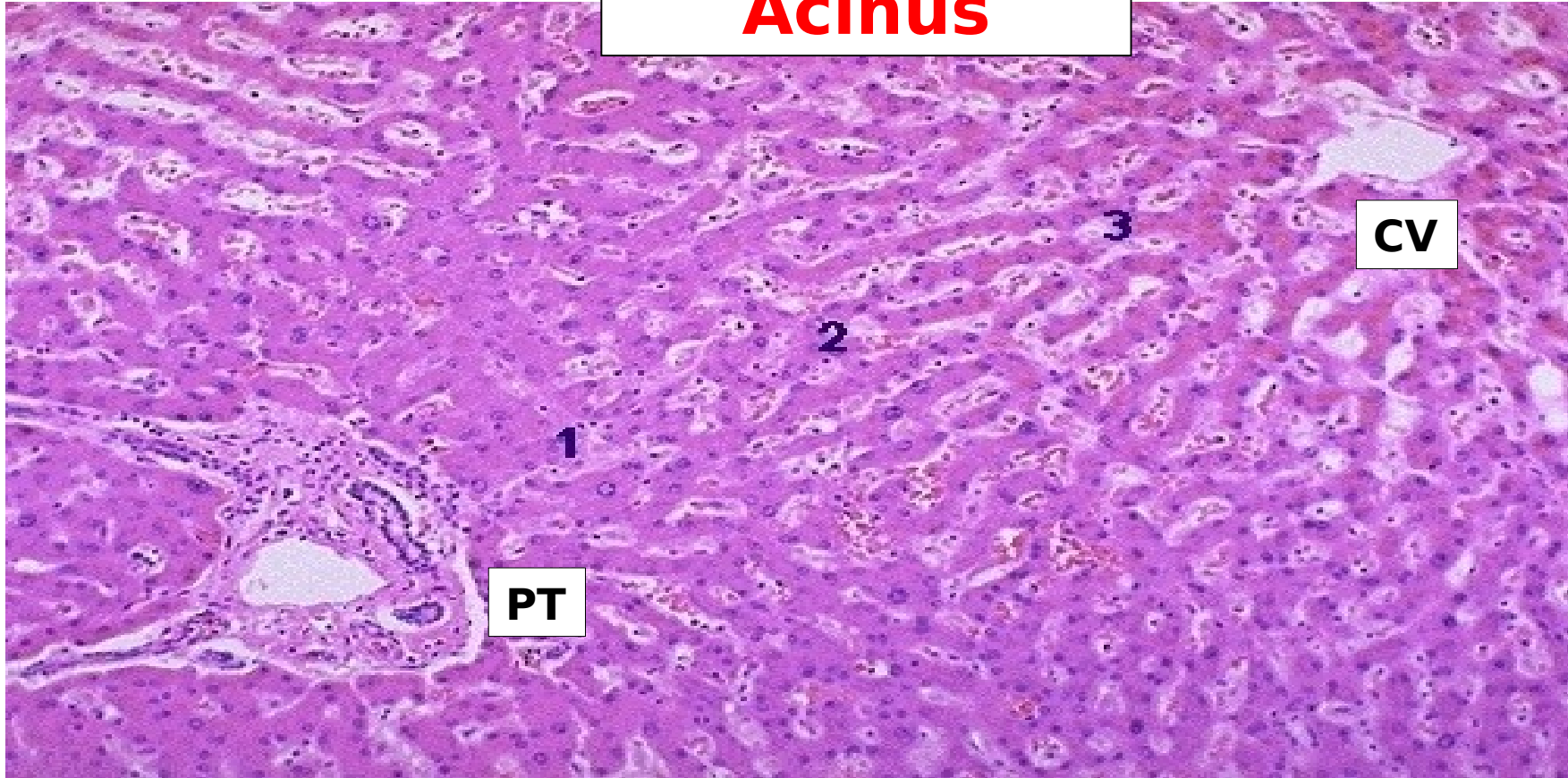


1. Part 1 (5min): Hepatic Response to injury
2. Part 2 (15 min) :Types of liver necrosis
3. Part 2 (20 min): Pathological features & fate of acute viral hepatitis.
4. Lecture Quiz (5 min)

Histology of the Liver



Hepatic Acinus



<https://library.med.utah.edu/WebPath/jpeg4/LIVER003.jpg>

Hepatic Response to Injury



Five general responses to injurious events:

**How
will it
react??**

**Degeneration eg.
ballooning**

**Accumulation of (fat,
bile ,iron, copper,)**

**Apoptosis , Necrosis & Necro -
Inflammation**

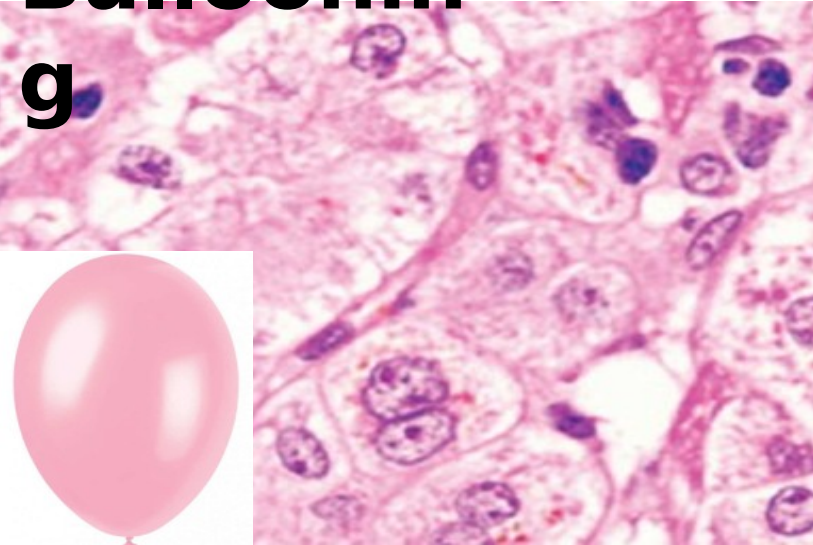
Fibrosis +/- Cirrhosis

**NB:most types of hepatic injury : mixture of
inflammation & hepatocyte death
=Necroinflammation**

Hepatic Response to Injury

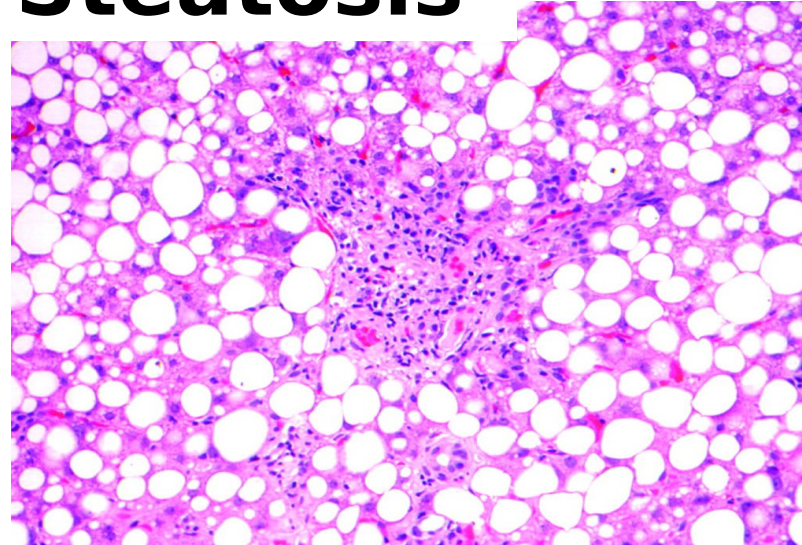


Ballooning



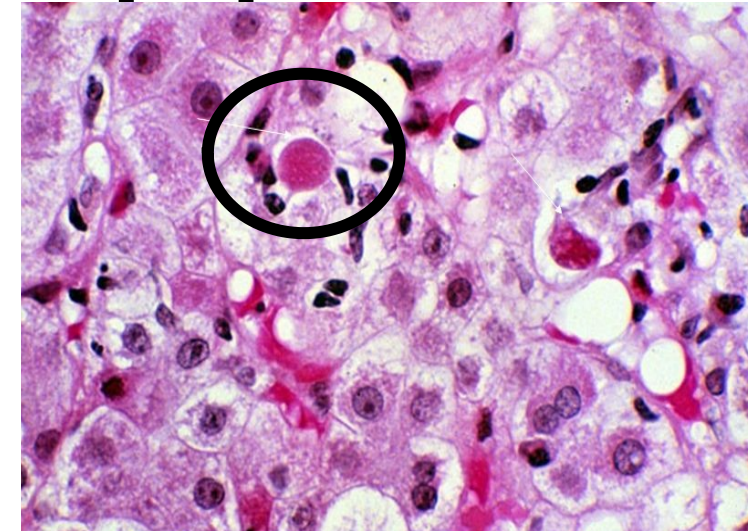
http://www.jiaps.com/articles/2012/17/4/images/JIndianAssocPediaterSurg_2012_17_4_147_102326_f3.jpg

Steatosis

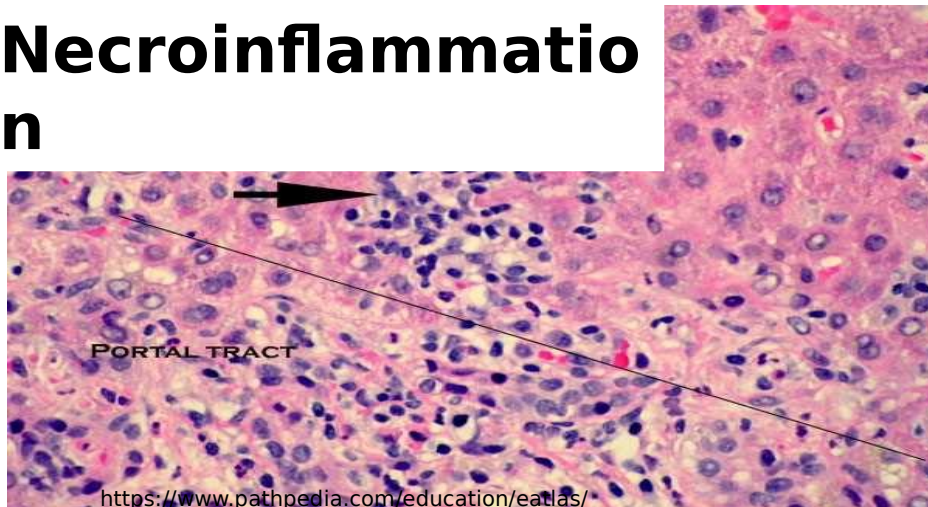


http://medcell.med.yale.edu/histology/digestive_organs_lab/images/steatosis.jpg

Apoptosis

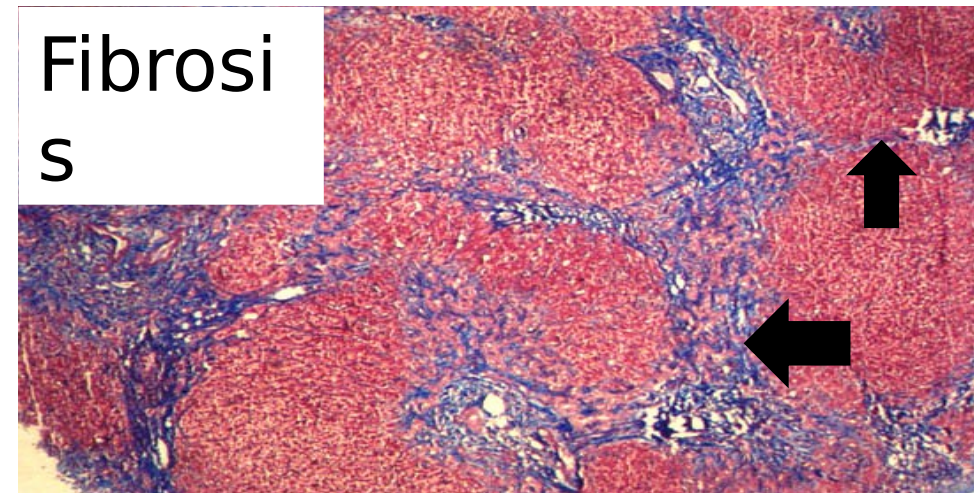


Necroinflammation



[https://www.pathpedia.com/education/atlas/histopathology/liver_and_bile_ducts/chronic_hepatitis_c/chronic-hepatitis-c-\[4-li034.jpeg?width=600&height=450&format=jpg\]](https://www.pathpedia.com/education/atlas/histopathology/liver_and_bile_ducts/chronic_hepatitis_c/chronic-hepatitis-c-[4-li034.jpeg?width=600&height=450&format=jpg])

Fibrosis



<http://www.meddean.luc.edu/lumen/MedEd/orfpath/images/fig72x.jpg>

Liver necrosis



Different PATTERNS /SITES of liver necrosis



**Related to etiology/ severity /
host factors**

What are the different PATTERNS /SITES of liver necrosis



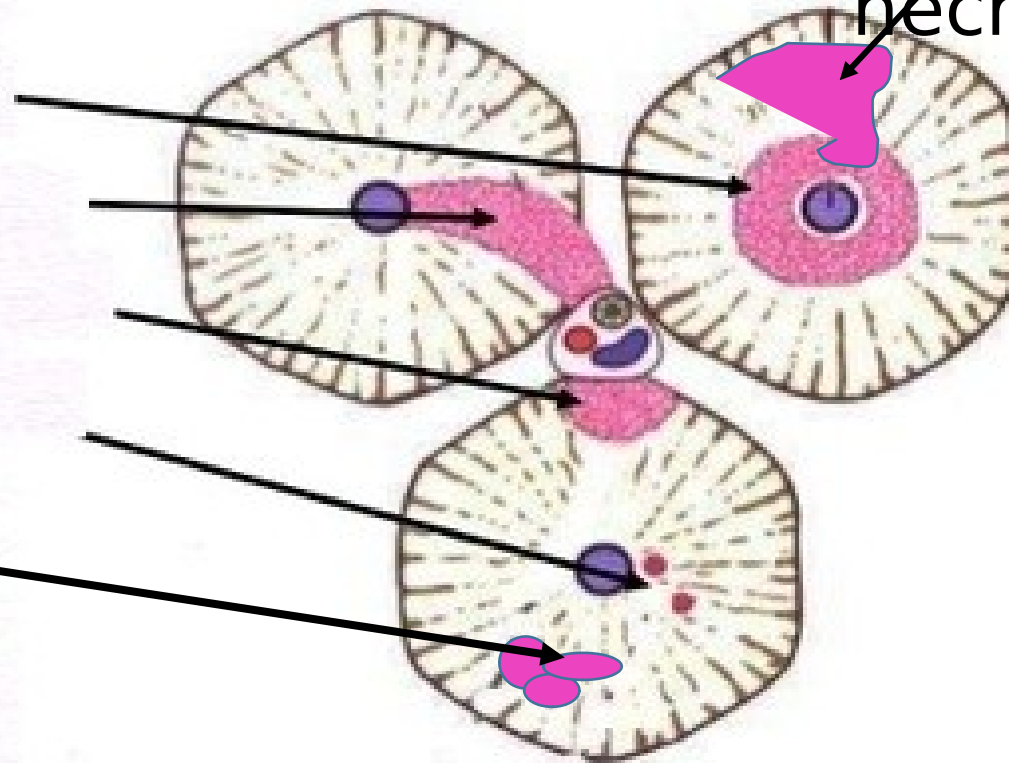
- 1. Focal Necrosis(lobular hepatitis):** Necrosis of a small group of hepatocytes in parenchyma + focal Cellular Drop out +inflammatory infiltrate
- 2. Zonal necrosis :** affecting one of zones eg. centrilobular or periportal
- 3. Confluent Necrosis:** around central vein extending to more than one zone
- 4. Piece Meal Necrosis/Interface hepatitis** = Hepatocyte necrosis & inflammatory cells (spilling over replacing hepatocytes) disrupting limiting plate
- 5. Bridging necrosis (Porto-portal /Porto-**

Where

Pattern of Liver Damage

- Zonal
- Bridging
- Interface
- Apoptotic
- Focal necrosis
- Massiv

- Confluent necrosis

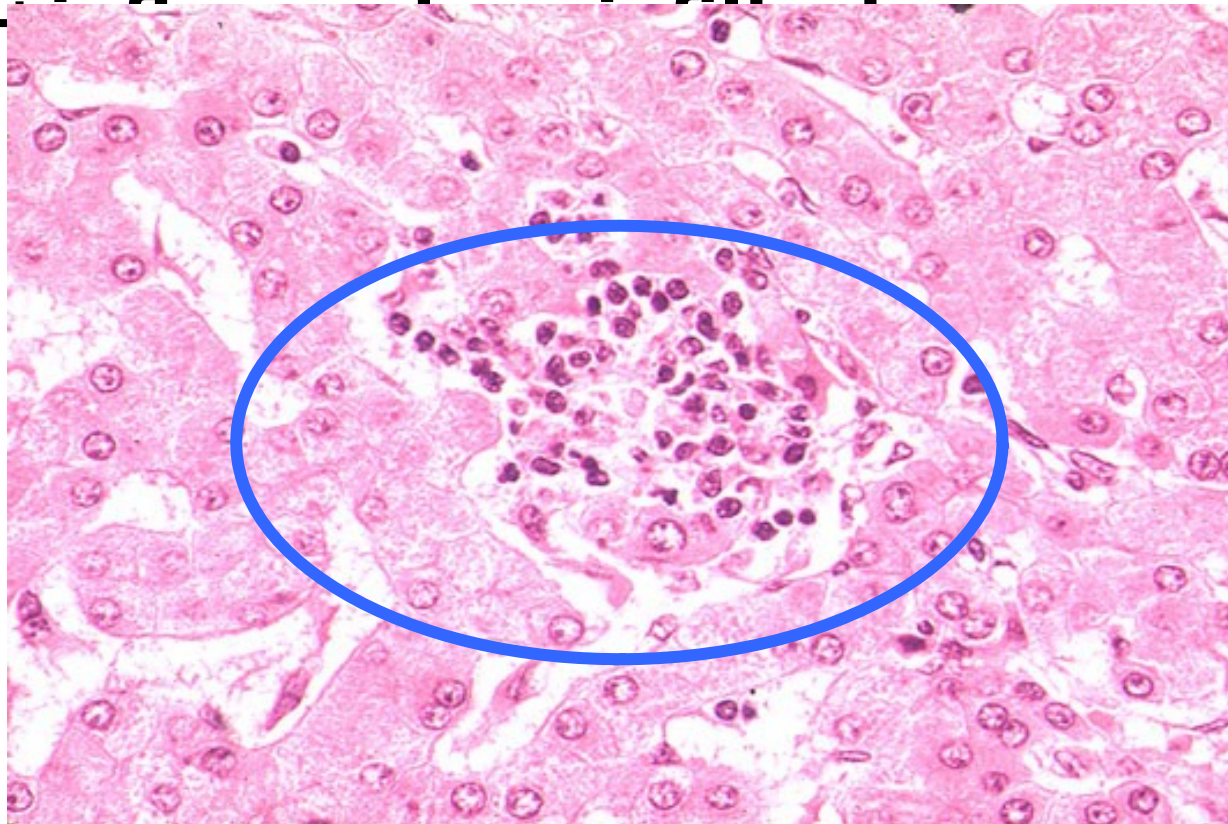


Liver necrosis



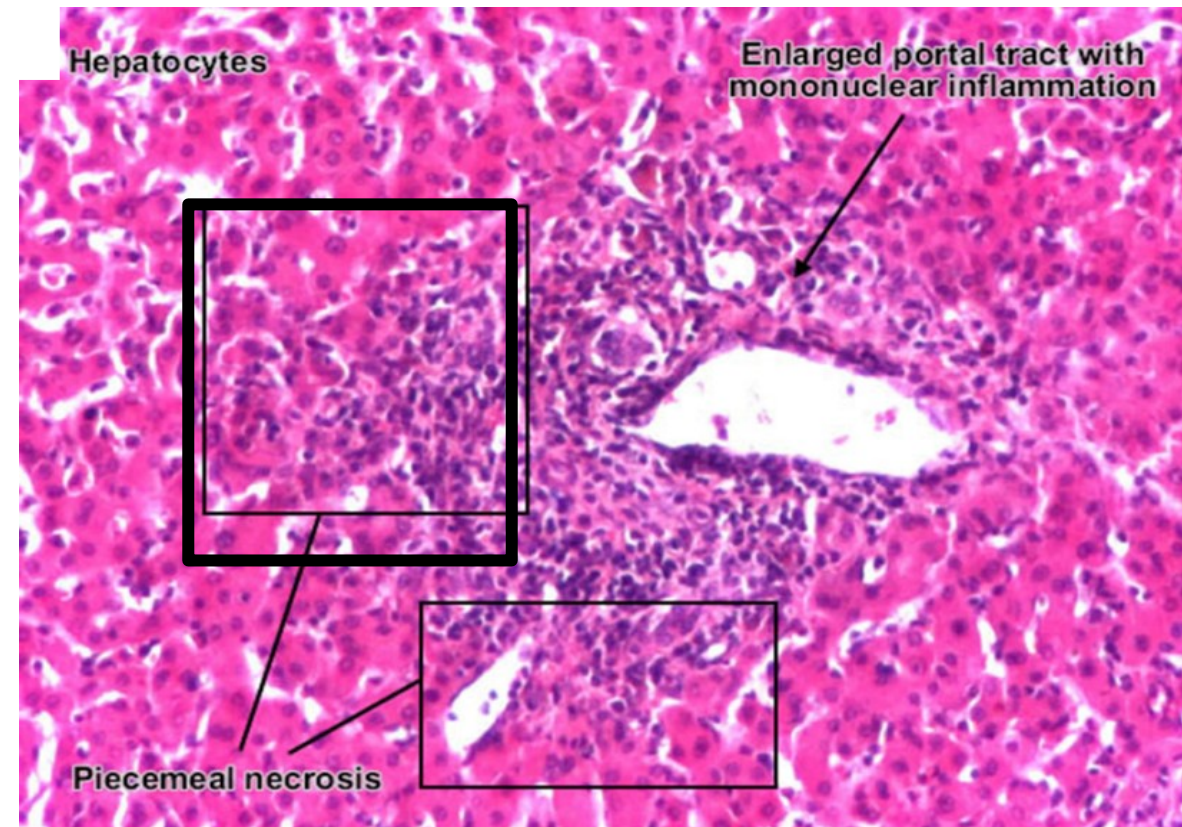
**Focal or Spotty Necrosis or
Lobular hepatitis**

Necrosis + Cellular Drop out



GIT & Metabolism module

**Piece Meal
Necrosis =
Interface Hepatitis**

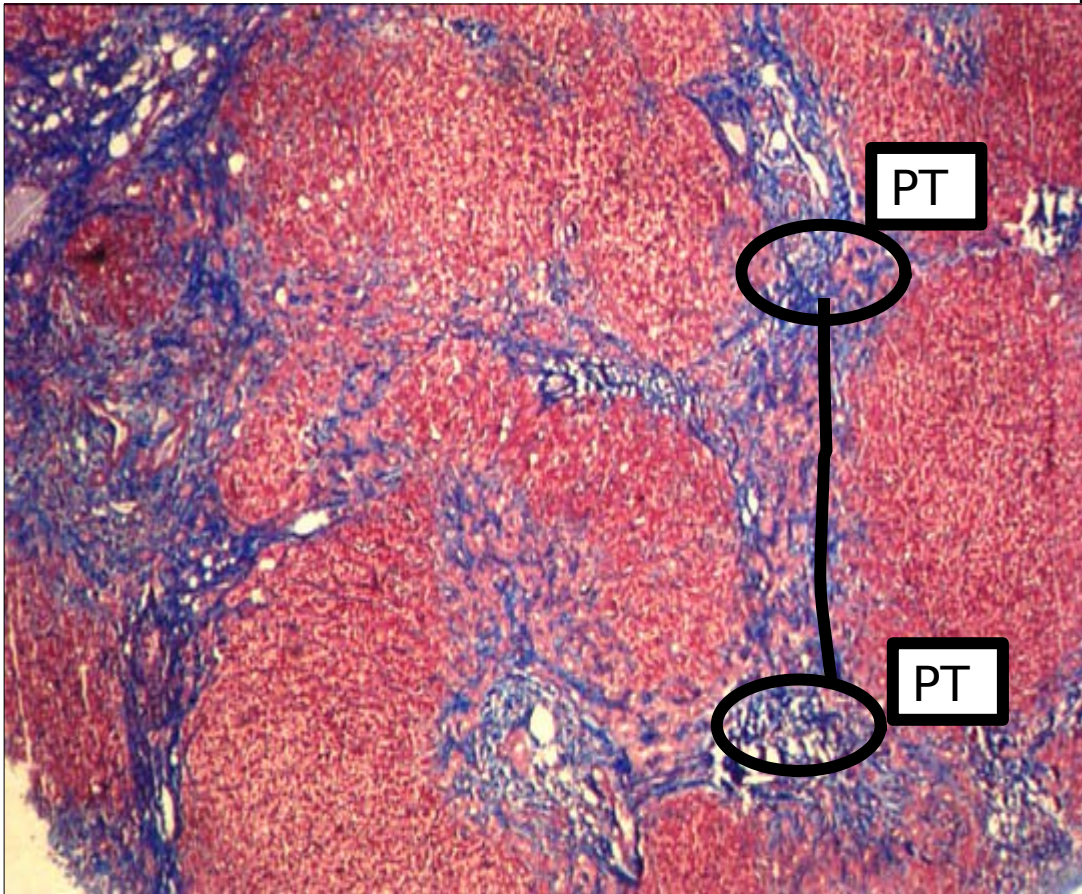


<https://foodandprocessing.files.wordpress.com/2017/03/art-102.jpg>

Liver necrosis

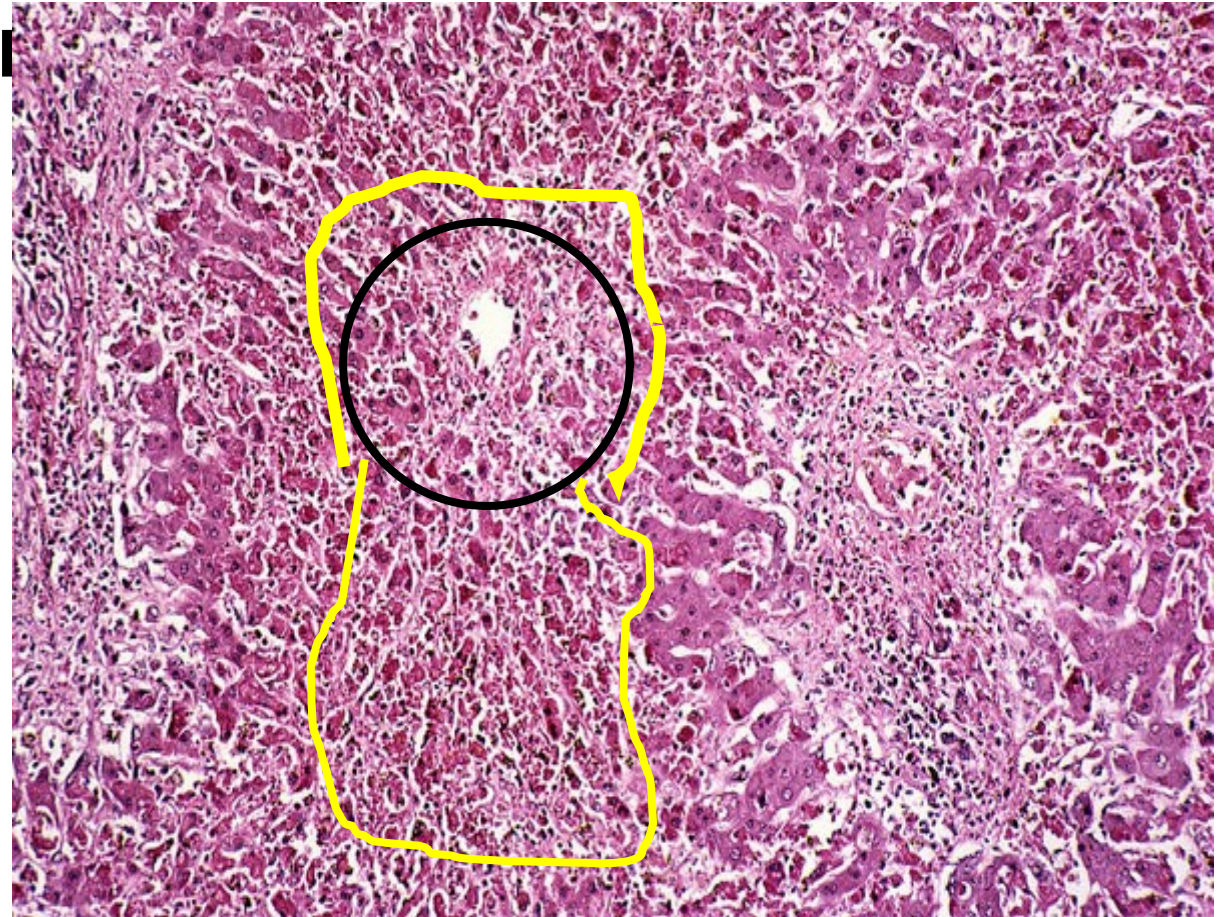


Bridging Necrosis



<http://www.meddean.luc.edu/lumen/MedEd/orfpath/images/fig72x.jpg>

Confluent & Zonal Necrosis



<https://render.fineartamerica.com/images/rendered/default/print/8.000/5.375/break/images-medium-5/yellow-fever-in-the-liver-zonal-necrosis-caused-by-the-yellow-fever-virus-he-stain-lm-x31-dr-frederick-skvara.jpg>

Liver necrosis



Massive Hepatic Necrosis(Acute yellow)

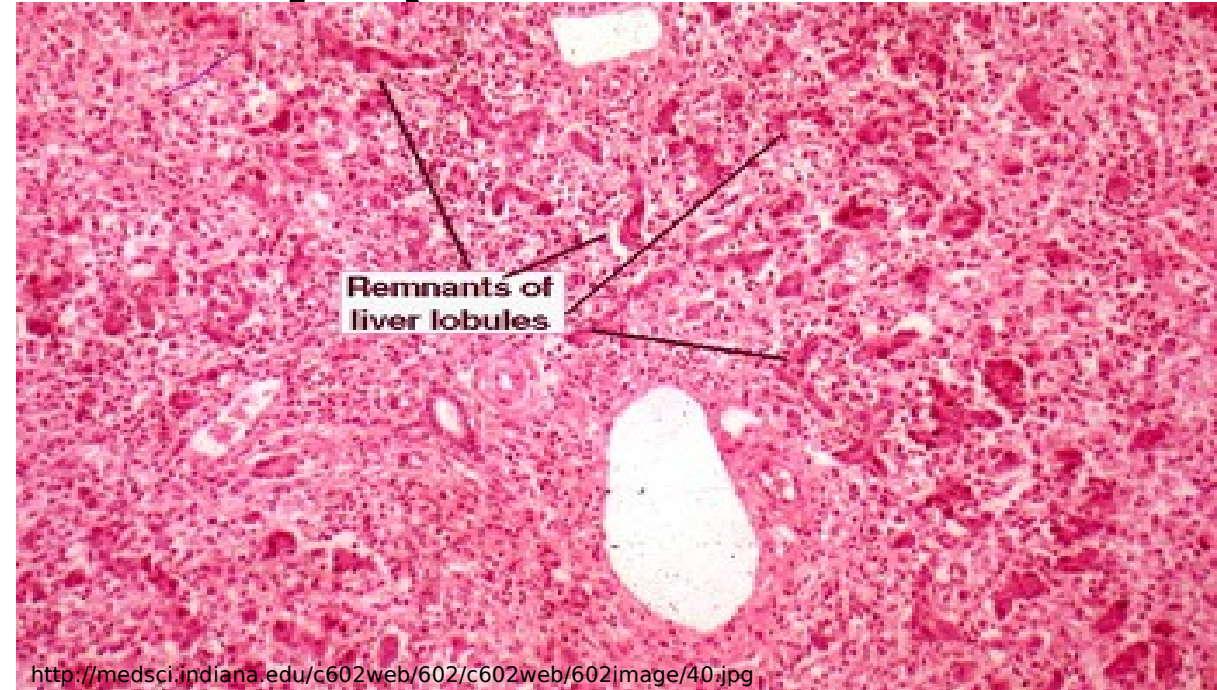
Fatal



<http://www.meddean.luc.edu/lumen/MedEd/orfpath/images/fig104x.jpg>

Grossly:

- Shrunken soft
- Wrinkled capsule,
- Cut surface :alternating yellow (necrosis & bile) and dark areas (hemorrhage)



<http://medsci.indiana.edu/c602web/602/c602web/602image/40.jpg>

Microscopically:

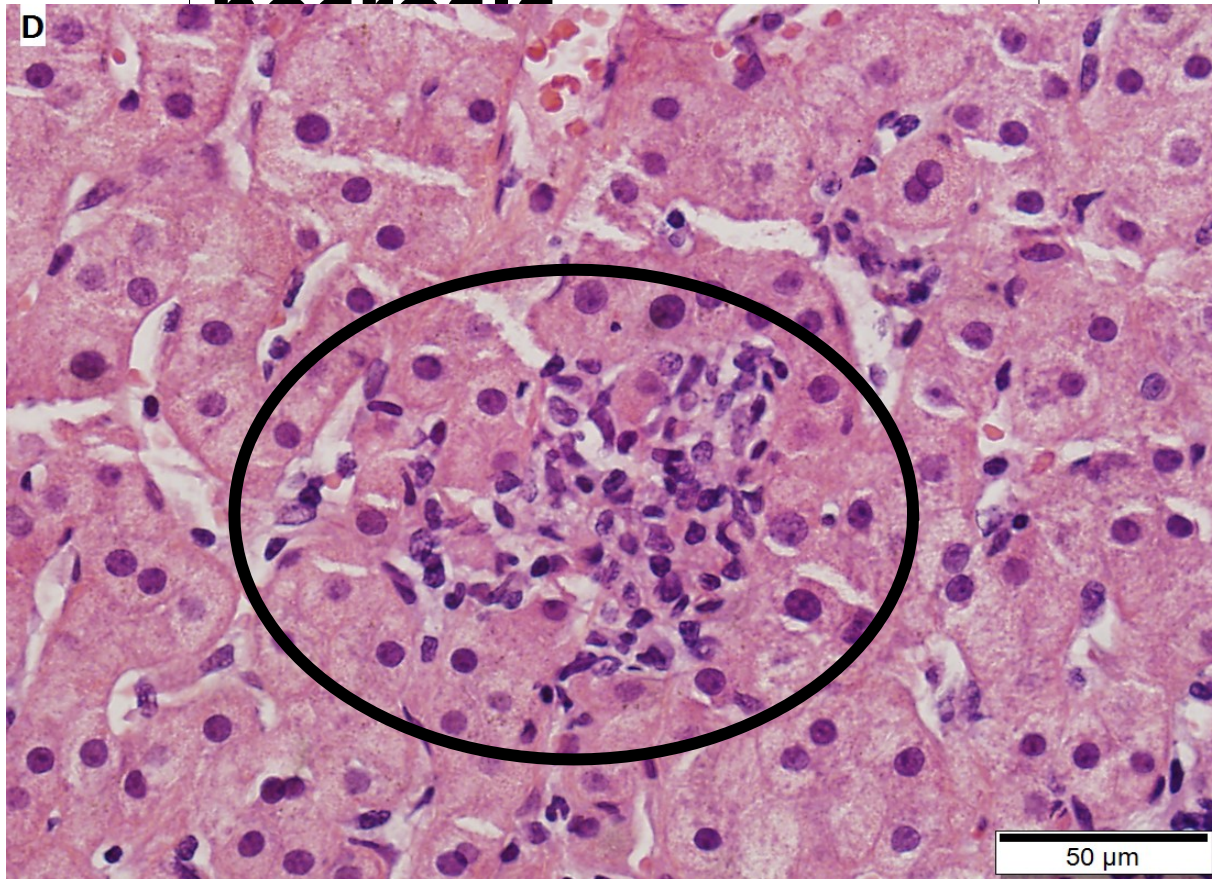
- Necrosis of most of hepatocytes
- Collapsed reticulin framework with few viable hepatocytes &

Liver necrosis



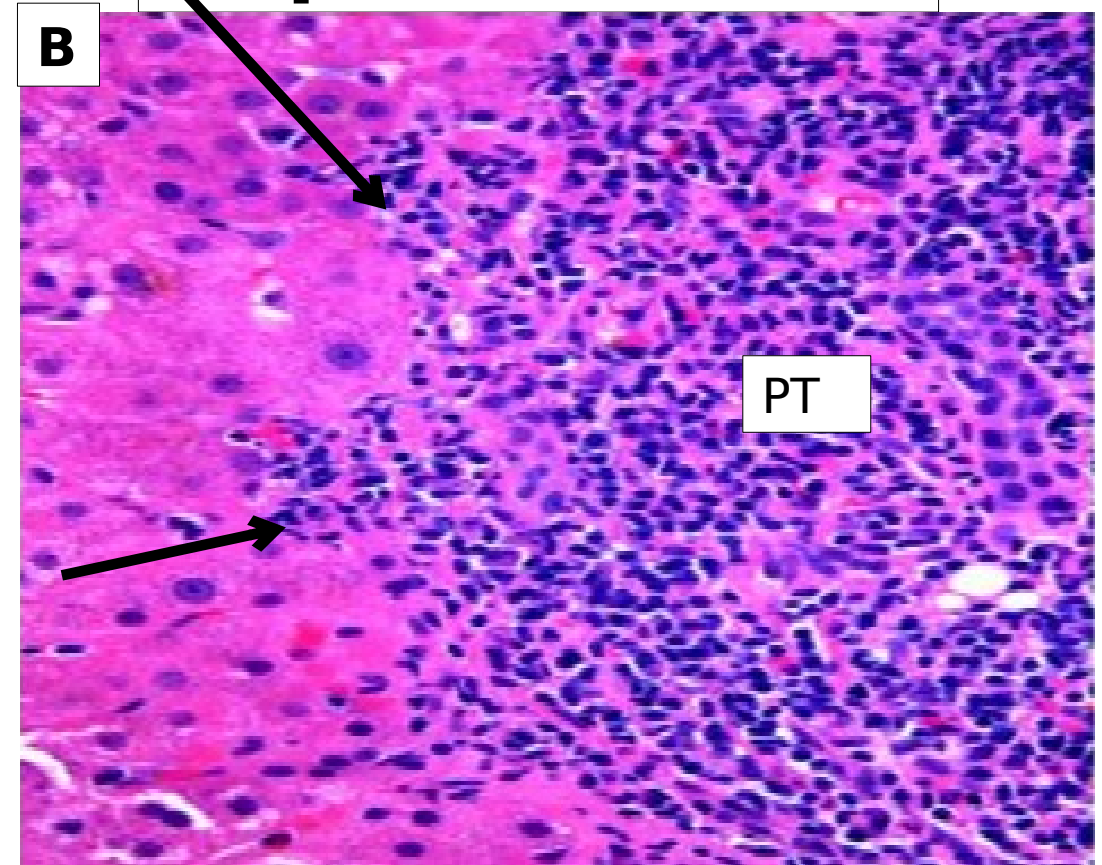
**Define the
lesion**

**Lobular
hepatitis /spotty
necrosis**



https://upload.wikimedia.org/wikipedia/commons/6/6f/4_90507225729061_sl_4.png

**Interface
Hepatitis**



<https://img.medscapestatic.com/fullsize/migrated/524/097/mgm524097.fig1.gif>

Hepatitis



What are the causes of hepatitis ?

Infectious

Hepatotropic

Have a specific affinity for liver

Viruses A,B,C,D,E

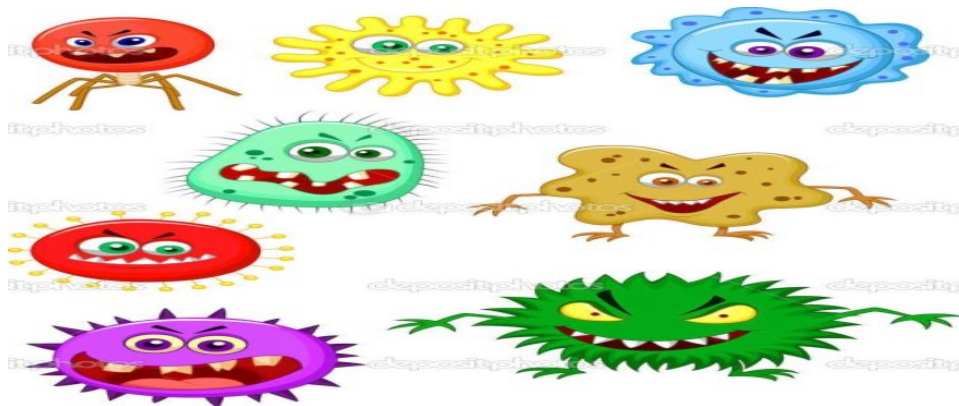
Non

Hepatotropic

EBV-CMV-HSV

**Non
infectious**

- Autoimmune
- Alcohol & NASH
- Drugs etc



Hepatitis



What are the clinical features of acute viral

Doctor do I have acute viral hepatitis?



• C/P:

- Low grade fever, anorexia, nausea, vomiting
- Dark urine & pale stools
- **Jaundice**
- Enlarged tender liver

• Investigations :

- **Elevated liver enzymes: AST,ALT**
- **Elevated conjugated bilirubin**

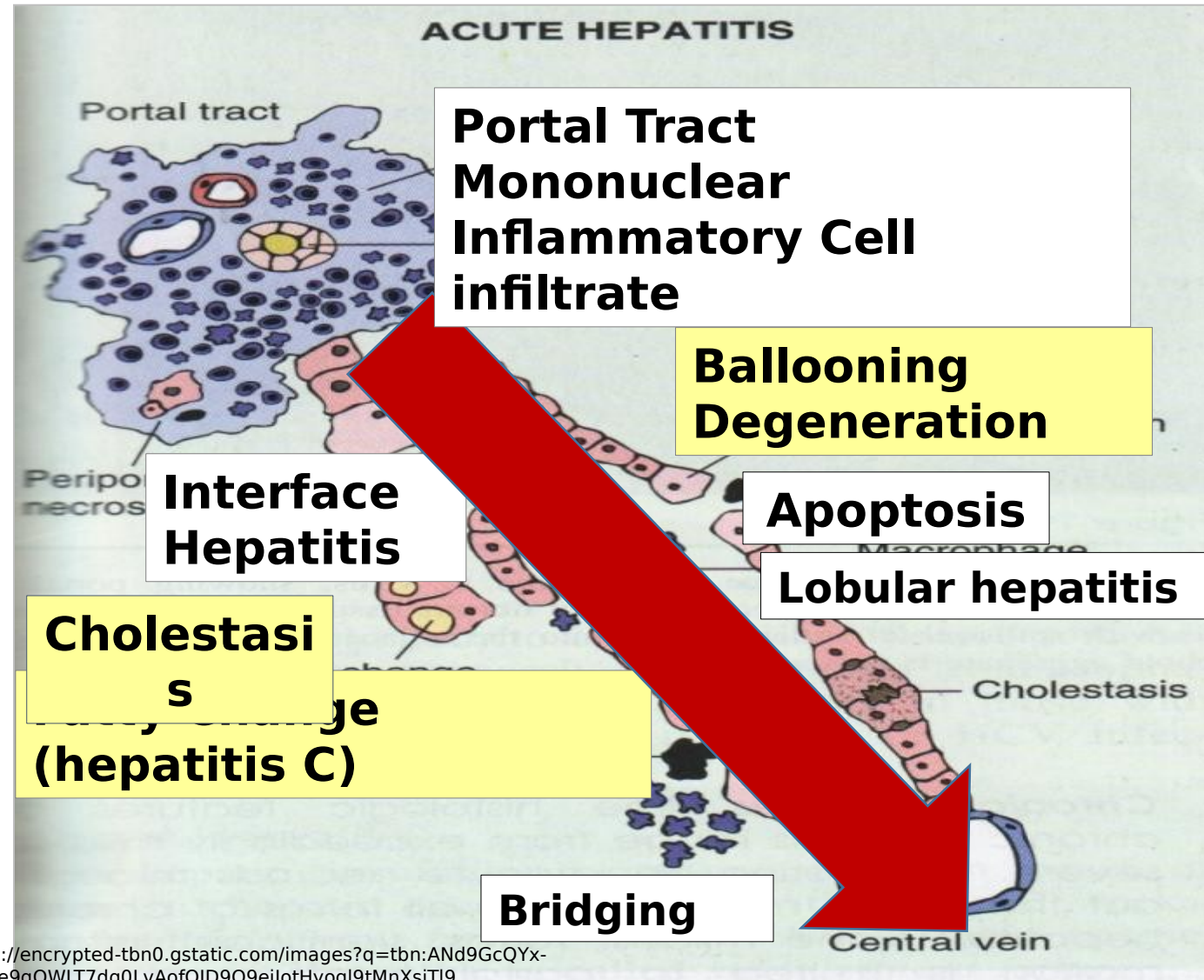
These are the Pathological Features of Acute (Viral) Hepatitis



Grossly: enlarged
reddened liver



<https://slideplayer.com/slide/3424216/12/images/39/Acute+hepatitis%3A+HBV.jpg>



<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcQYx-raqlle9nQWlT7dq0l vAofQID9Q9eilotHyog19tMnXsiTl9>

Mic:

1. Liver framework: Not affected.

2. Hepatocytes injury

- **Ballooning** degeneration (retention of water)
- **Cholestasis** = accumulation of bile in hepatocytes & bile canaliculi
- **Steatosis** : accumulation of fat in hepatocytes

3. Necrosis & inflammation

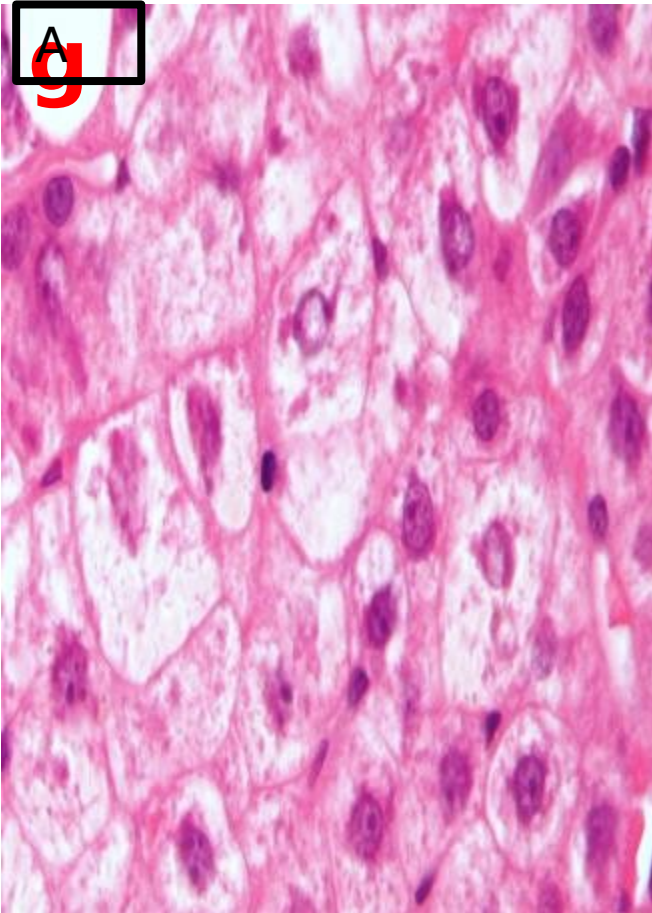
- Apoptosis & Lobular hepatitis
- Portal inflammation
- Interface hepatitis
- Bridging necrosis

Hepatic Response to Injury (Quiz)

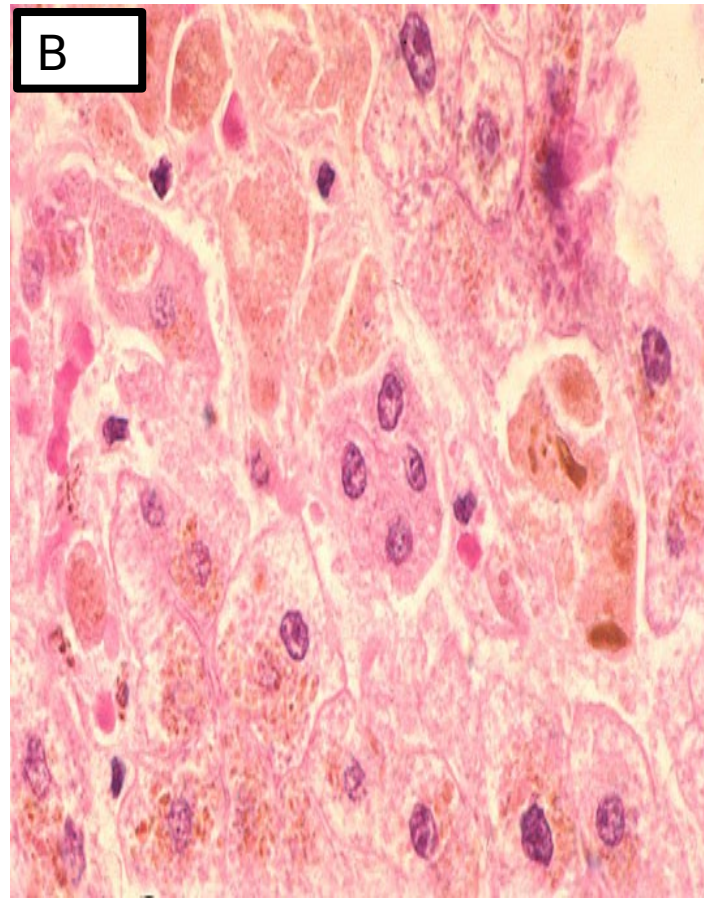


Name the below changes in hepatic injury

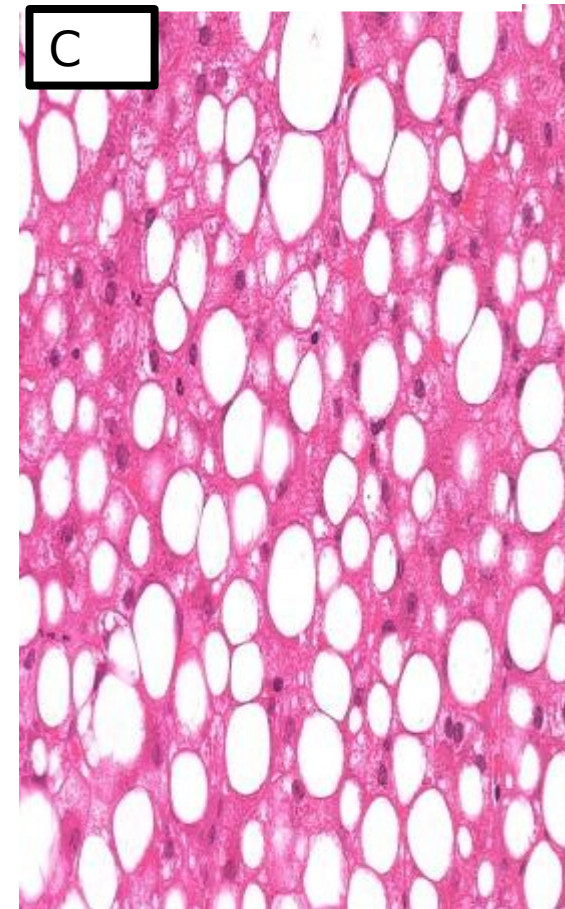
Balloonin



Cholestasis



Steatosis

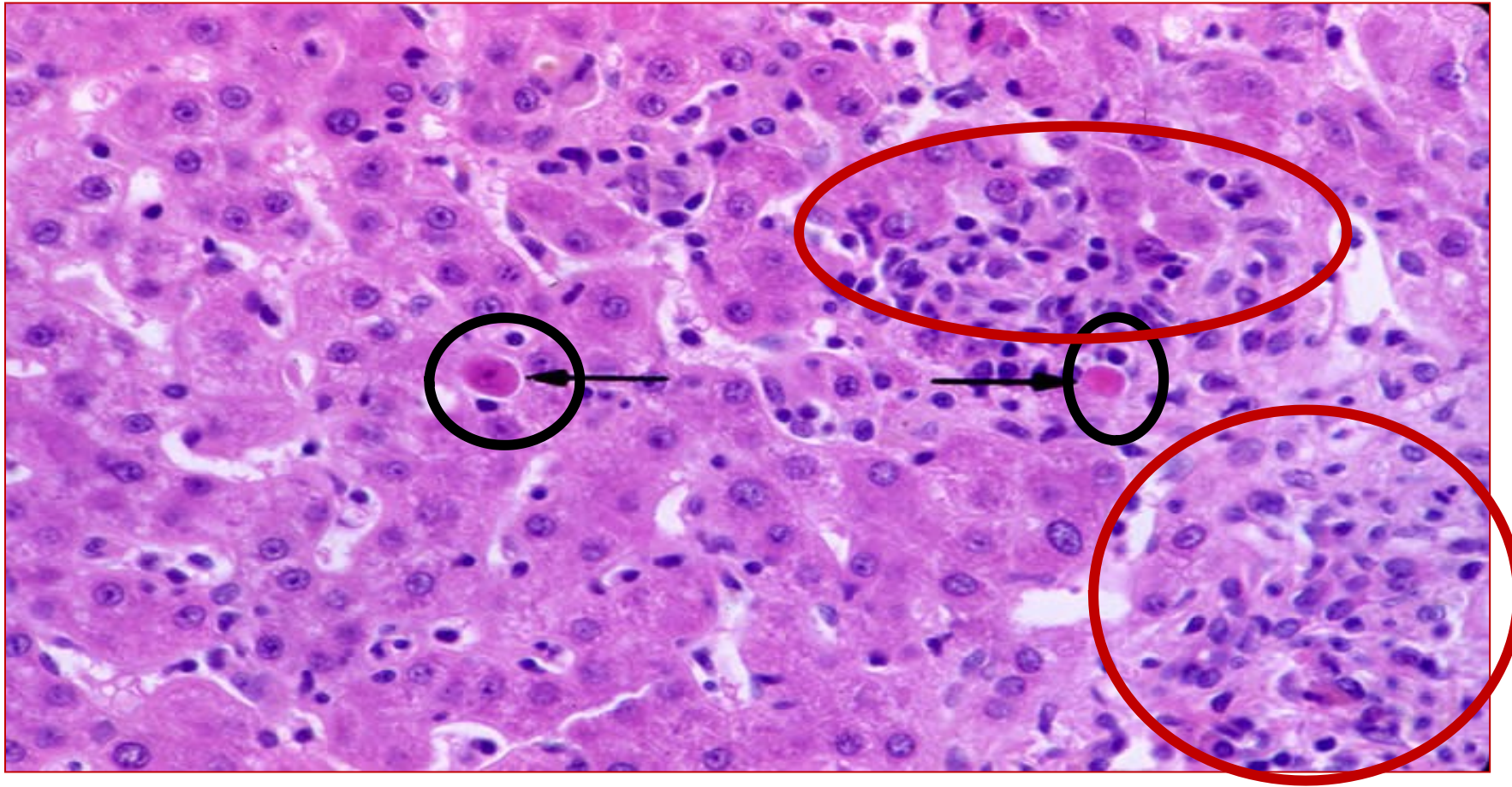


Ask me



Hepatic Response to Injury (Quiz)

Name the below changes in hepatic injury

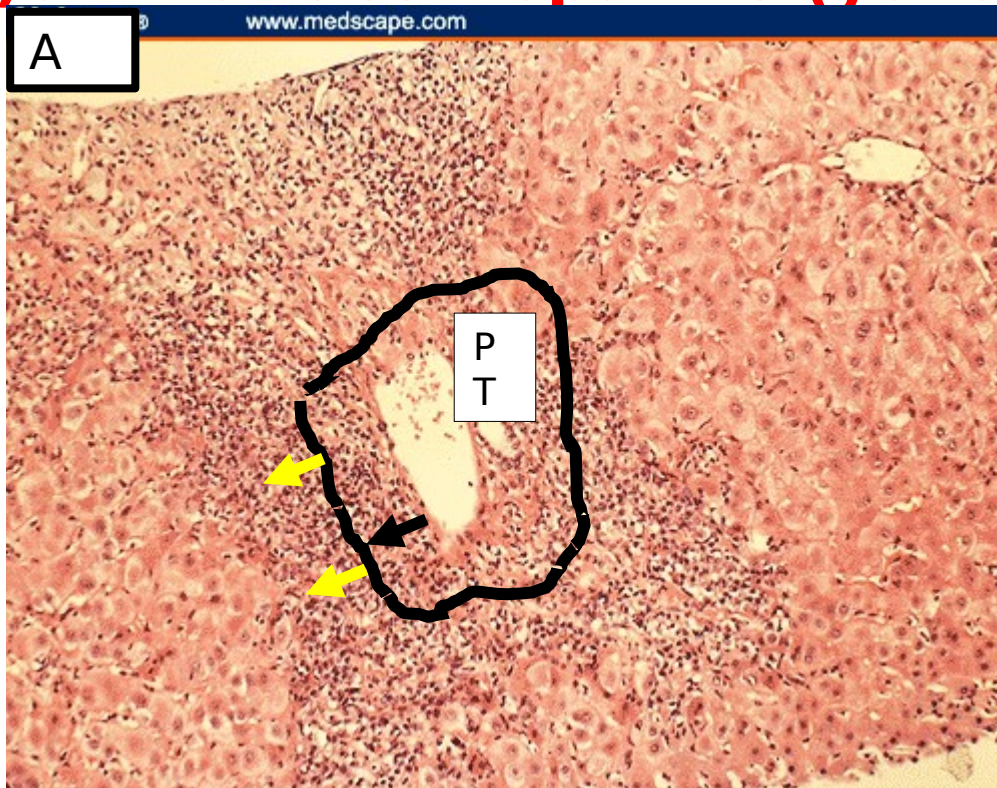


Apoptotic bodies and lobular inflammation

Hepatic Response to Injury (Quiz)

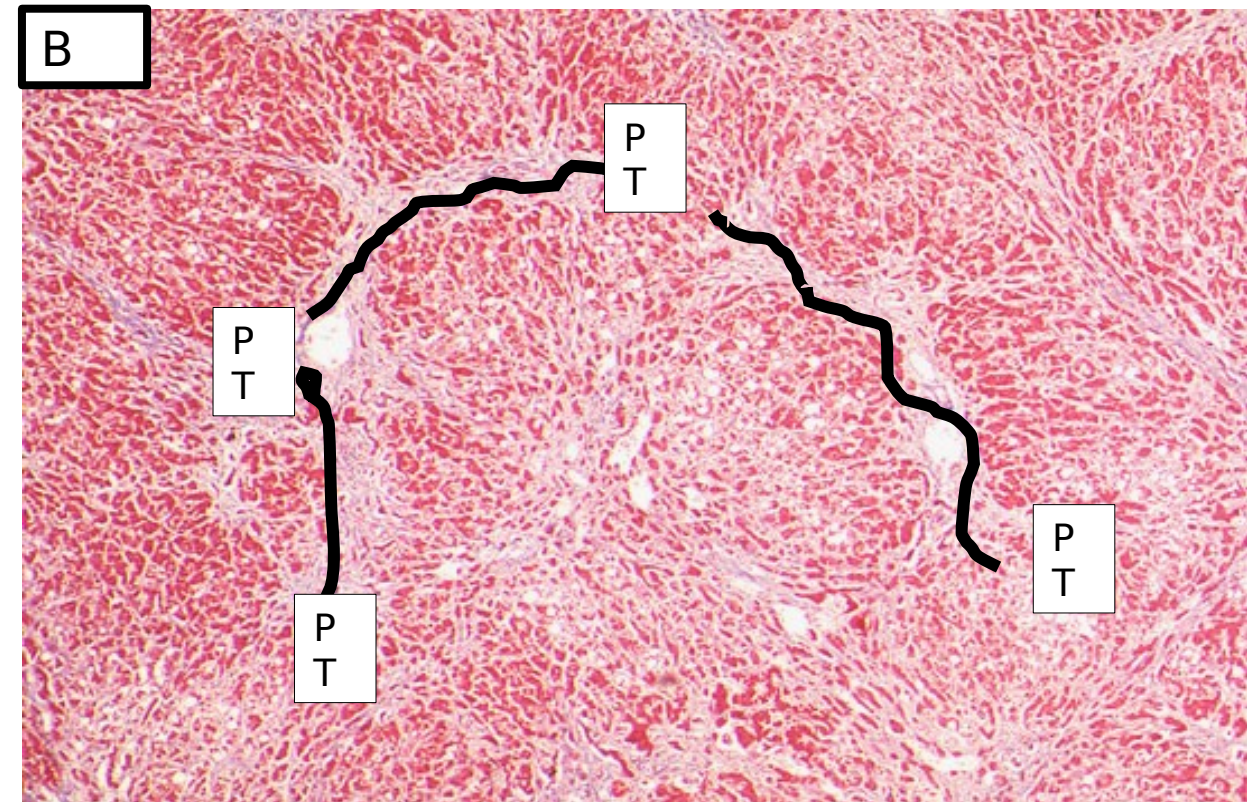
Name the below changes in hepatic injury

**Portal Inflammation (black arrow)
& Interface Hepatitis (yellow**



<https://img.medscapestatic.com/fullsize/migrated/524/097/mgm524097.fig1.gif>

Bridging necrosis



<http://www.meddean.luc.edu/lumen/MedEd/orfpath/images/fig100x.jpg>

Fate of Acute Viral Hepatitis

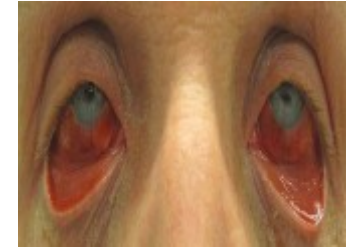


1.Recovery

Mostly in all cases of HAV & HEV

2.Fulminant hepatitis

(massive hepatic necrosis)



3.Carrier

4.Chronic hepatitis:

about 10% of HBV
more than 80% of HCV

5.Cirrhosis

6.Hepatocellular carcinoma



CHRONIC DISEASE!



Piece-meal necrosis involves which of the following liver tissue ?

- A. Single liver cells.
- B. Most of the liver tissue.
- C. Scattered groups of liver cells in the hepatic lobule.
- D. Hepatocytes at the limiting plate of the hepatic lobules.

Liver Necrosis (Quiz)

Piece-meal necrosis involves which of the following liver tissue ?

- A. Single liver cells.
- B. Most of the liver tissue.
- C. Scattered groups of liver cells in the hepatic lobule.
- D. Hepatocytes at the limiting plate of the hepatic lobules.**

Fate of Acute Viral Hepatitis (Quiz)



A 26 year old female presents with fever ,malaise, mildly enlarged tender liver. Lab studies reveal increased liver enzymes and increased anti-hepatitis A titre.Which of the following is the most likely result of this infection?

- a.Cirrhosis
- b.Complete resolution
- c.Development of chronic carrier state
- d.Hepatocellular carcinoma

Fate of Acute Viral Hepatitis (Quiz)



A 26 year old female presents with fever ,malaise, mildly enlarged tender liver. Lab studies reveal increased liver enzymes and increased anti-hepatitis A titre.Which of the following is the most likely result of this infection?

- a.Cirrhosis
- b.Complete resolution**
- c.Development of chronic carrier state
- d.Hepatocellular carcinoma

Keypoints



- Hepatic response to injury shows different forms according to severity of injury
- Hepatic necrosis shows different patterns
- Hepatitis may be due to infectious or non infectious causes
- Fate of viral hepatitis is variable

Suggested Textbooks



Neil D. Theise. Liver and gall bladder. In Robbins and Cotran pathologic basis of disease, 10th edition. Kumar, Abbas & Aster (eds). Elsevier Saunders. Pages 637-676

